

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Passive multimodal tomography for dry storage casks imaging using passive neutron and gamma dosimetry and cosmic ray muons – Colorado School of Mines

SECTION B. Project Description

The Colorado School of Mines proposes to develop a method for multimodal tomography of dry storage casks to determine fuel relocation and cladding failures using passive neutrons and gamma emissions in combination with cosmic ray muons. The use of multimodal imaging will allow 3-D reconstructions of the dry storage cask that would be unachievable with any one radiation source. Dry storage casks will continue to play a critical role in the handling of spent nuclear fuel in the United States until a location for final disposition is determined. Monitoring the internal conditions in them is essential to ensure that they are performing as intended. By the end of the proposed work the project team will develop and deliver: 1) A recommissioned cosmic ray muon imaging system optimized for dry cask inspection; 2) Optimized algorithms for dry cask inspection tomography using muons, neutrons and gamma rays; and 3) Dry cask test pad data for validation of dry cask non-invasive inspection imaging methods to detect fuel movement and the presence of fission gases inside a sealed dry storage cask.

SECTION C. Environmental Aspects / Potential Sources of Impact

The university has procedures in place to handle any waste that will be generated through this project. The action would not create additional environmental impacts above those already occurring at the university.

SECTION D. Determine the Level of Environmental Review (or Documentation) and Reference(s): Identify the applicable categorical exclusion from 10 CFR 1021, Appendix B, give the appropriate justification, and the approval date.

Note: For Categorical Exclusions (CXs) the proposed action must not: 1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, including requirements of DOE orders; 2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities; 3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; 4) adversely affect environmentally sensitive resources. In addition, no extraordinary circumstances related to the proposal exist which would affect the significance of the action, and the action is not “connected” nor “related” (40 CFR 1508.25(a)(1) and (2), respectively) to other actions with potentially or cumulatively significant impacts.

References: B3.6 Siting, construction, modification, operation, and decommissioning of facilities for small-scale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). For purposes of this category, “demonstration actions” means actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment. Demonstration actions frequently follow research and development and pilot projects that are directed at establishing proof of concept.

Justification: The activity consists of the development of a multimodal imaging system for dry cask inspection.

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Jason Anderson, DOE-ID NEPA Compliance Officer, on 08/12/2021.